MM 29 Symposium Tomographic Methods in Materials Research Hauptvortrag Paul Midgley

Zeit: Montag 10:30–11:00 Raum: TU H1058

Hauptvortrag

MM 29.1 Mo 10:30 TU H1058

Nanoscale electron tomography for materials science — •P.A. Midgley, T.J.V. Yates, J.R. Tong, and I. Arslan — Department of Materials Science and Metallurgy, University of Cambridge, Pembroke Street, Cambridge, CB2 3QZ, UK

The explosion of interest in nanoscale structures and devices across a wide spectrum of materials brings with it a need for characterisation tools that will allow the structure, composition and other physical properties to be measured at the nanometre level and in three dimensions. Tomographic techniques enable the three-dimensional reconstruction of objects from a series of images, often recorded at successive tilts. Electron tomography in the transmission electron microscope has been used in various forms in the life sciences for over three decades to study many macromolecular structures, organelles, viruses and so on. However, it is only in the past five years that electron tomography has been used by those in the materials science community. In that short time it has changed from a technique of some curiosity to one which is now seen as a vital component in the armoury of any material microscopist. The rapid adoption of the technique has been driven in part by an automation of the electron microscope and a subsequent improvement in acquisition routines and by the introduction of new tomographic imaging methods that satisfy the projection requirement even for crystalline objects. In this paper I will present a number of examples of electron tomographic reconstructions, including carbon nanotubes, heterogeneous catalysts and intermetallic alloys that demonstrate how electron tomography can yield accurate, quantitative results at the nanoscale that cannot be achieved using any other technique.